

Informatik

Universität - Paderborn

Informatik - Home

AG - Monien

Research

Projects

Publications

Teaching

People

Service

Impressum
Webmaster**AG-M****Combinatorial Optimization**> *Main* > *Simulated Annealing* > *Branch & Bound* > *Tabu Search*

Parallel Simulated Annealing

Simulated Annealing (SA) is a meta-heuristic applicable to nearly arbitrary combinatorial optimization problems. SA is a randomized local search strategy which is able to perform moves. Thus, it may escape from local minima and find solutions which are much better than those of pure local search.

The performance of SA depends heavily on the choice of parameters and on the way it is coded. The parameters (the *cooling schedule*) determine the number of steps (i.e. time) the algorithm performs. Usually, a large number of steps are necessary in order to find real good solutions.

We developed a scheme for parallelizing SA which is independent of the problem itself. The scheme is based on parallelizing the search process. Each processor receives the whole instance and performs search moves. The decision whether a move is accepted or not is made by a central processor (in the simple version called *One-Chain*). The algorithm achieves good performance from the fact that - at low temperatures - nearly all moves are not accepted, thus, independent of each other.

For more information, please contact Georg Kliewer or look at the Parallel Simulated Annealing Library.

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